

Claim 3 has been placed in independent form. The claim has been amended to positively recite the surgical tool in the body of the claim. The reference to the tool reference frame has been deleted.

Claims 27 and 30 have been placed in independent form as suggested by the Examiner.

Claims 1, 2 and 4-15 are in condition for allowance

Claim 1 stands rejected as anticipated by Barrick. The office action states that Barrick's fluoroscope 200 is a means for indicating to a human the difference between the actual and desired positions of the tool and that its optical digitizer 212 is a means for determining the actual position of the means for indicating.

Claim 1 has been amended to require a display means for indicating to a human the difference between the actual and desired positions of the tool and means for determining an actual position of the display means.

Barrick's fluoroscope 200 is not a display means for indicating . . . as required by claim 1. The fluoroscope 200 contains an x-ray source 231 and detector 232. The resultant fluoroscopic image is displayed in human readable form on a separate monitor screen 400 (not shown).

Barrick's optical digitizer 212 is not a means for determining an actual position of the display means as required by claim 1. While Barrick teaches that the optical digitizer 212 is used to determine the position of the fluoroscope 200, Barrick fails to disclose or suggest a means for performing the recited function -- determining an actual position of the display means.

Regarding dependent claim 2, Barrick does not disclose or suggest that the position difference information be indicated with respect to the tool reference frame. The office action cites Barrick column 6, lines 13-23 to the effect that the drill 301 is characterized by a tool reference frame and that the difference is indicated in relation to the tool reference frame. This is traversed. Barrick's drill 301 contains LEDs 300 which are used by the optical digitizer 212 to

determine the position of the drill. The cited language teaches that this information is used to display the position of the drill superimposed on the image on the monitor screen 400, irrespective of how the image or monitor may be oriented. Stated another way, the position of the drill is shown in the image reference frame.

With continuing reference to claims 1-3 and further reference to claims 4-15, the office action states that the LED's 201, 202 on Barrick's fluoroscope indicate a direction in which the tool should be moved to reach a desired position. In fact, the LEDs 201, 202 provide a signal indicative only of the actual position of the tool with respect to the optical localizer 212. Even then, this information is not provided in a form understandable to a human. Only after further processing and with additional information (such as the desired position, the relative relationships between the various reference frames, and the like) can the direction in which the tool should be moved be displayed in human readable form on Barrick's monitor 400 (not shown). To clarify any confusion in this regard, claim 1 was previously amended to require that the means for indicating provide the information in a form understandable to a human.

More specifically to claim 10, the previous office action fails to provide any indication whatsoever as to the corresponding features in Barrick. Lacking this information, applicant is unable to respond to the rejection. More specifically to claims 13, 21 and 34, the office action fails to indicate what in Barrick corresponds to the mode indicator or the position indicator. Even if Barrick's LED's are considered to be human readable position indicators - which is traversed above - there is no teaching that the LED's include a mode indicator or that there is a mode selection step. Turning to claim 15, Barrick fails to disclose or suggest that the LEDs be mounted in a plane perpendicular to the tool's pointing axis (see Barrick Figure 3). Applicant requests that, in the event that these claims are not allowed, the Examiner provide a statement of reasons for the rejection and an opportunity for applicant to respond in a meaningful way or, if appropriate, amend the claim.

Claim 16 has been canceled

Claims 17 and 19-23 are in condition for allowance

Claims 17, 19-23, and 25 stand rejected as anticipated by Cartmell.

Claim 17 has been amended to further require a means for communicating a position of the tool to an image guided surgery system. Cartmell discloses a standalone device which does not operate in conjunction with an image guided surgery system and which does not include or suggest the required means for communicating.

Claim 18 was previously canceled.

Claim 20, which depends from claim 17, further requires means for determining the relative orientations of the at least one indicator and the anatomy of the patient. No such function is performed by Cartmell, which determines only the relative orientations of the probe and the catheter without reference to the anatomy of the patient.

Claim 25 is in condition for allowance

As amended, claim 25 is directed to an apparatus which requires a surgical tool, a plurality of infrared emitters mounted to the tool for providing position signals to an infrared localizer, and at least one human readable position indicator mounted to the tool.

The office action states that Cartmell discloses a surgical tool having a plurality of infrared emitters mounted to the tool. This is traversed. Cartmell's probe 2 contains a rotating magnetic transmit coil which interacts with the receive coil. Because Cartmell's receive coil is located within the body, substituting infrared emitters and detectors for Cartmell's magnetic coils would destroy the functionality of Cartmell's device. Hence, claim 25 is neither anticipated nor suggested by Cartmell.

Claims 26 is in condition for allowance

Claim 26 has been amended to include the steps determining an actual position of a human readable position display having an indicator reference frame and utilizing the human

readable position display to indicate the direction in which the tool must be moved to reach the desired position, said indication being provided in relation to the display reference frame.

The office action states that Barrick's fluoroscope 200 is a means for indicating to a human the difference between the actual and desired positions of the tool and that its optical digitizer 212 is a means for determining the actual position of the means for indicating.

Barrick's fluoroscope 200 cannot fairly be characterized as a position display as required by claim 26. The fluoroscope 200 contains an x-ray source 231 and detector 232. The resultant fluoroscopic image is displayed in human readable form on a separate monitor screen 400 (not shown).

Barrick's optical digitizer 212 is not a means for determining an actual position of human readable position display as required by claim 26. While Barrick teaches that the optical digitizer 212 is used to determine the position of the fluoroscope 200, Barrick fails to disclose or suggest the steps of determining the actual position of a human readable position display. Likewise, Barrick fails to disclose or suggest using the display to indicate the direction in which the tool must be moved to reach the desired position, said indication being provided in relation to the display reference frame.

Claims 28, 29, 31, 33, 34, and 35 are in condition for allowance

Claims 28, 29, 33, 34, and 35 have been amended to depend from claim 27, previously indicated to be allowable.

Claim 31, which continues to depend from claim 26, has been amended to require that the human readable position display include a plurality of light emitting diodes.

Interview

Examiner Mercader is thanked for the courtesy extended during the telephonic interview held with the undersigned on January 15, 1999. The pending claims and the prior art were discussed. However, no agreement was reached at that time.

Other


Picker International, Inc. check no. 81773237 in the amount of \$324.00 to cover 33 total claims and 8 independent claims was sent with the Request for Reconsideration mailed December 16, 1998. The claims added therein were not entered, and the check was not returned. It is requested that the previous payment be credited to deposit account 16-1680.

Conclusion

The indication that claims 3, 24, 27, and 30 are directed to patentable subject matter is appreciated. As suggested by the Examiner, these claims have been placed in independent form. It is believed that these claims are now in condition for allowance.

As more fully set forth above, it is believed that claims 1, 2, 4-16, 17, 19-23, 25, 26, 28, 29, 31, and 33-35 distinguish patentably and unobviously over the prior art of record. An indication of allowability directed to these claims is earnestly solicited.

Respectfully submitted,


John J. Fry
Reg. No. 35,873

Picker International, Inc.
595 Miner Road
Cleveland, OH 44143

440 473-3455